JPRS: 4435

6 March 1961

SELECTIONS FROM JEN-MIN JIH-PAO, PEIPING, ON GEOLOGY, EXPLORATION, WEATHER FORECASTING, AND CARTOGRAPHY

By Hsiao Ying, Sung Cheng-hou, and others

- COMMUNIST CHINA -

Distributed by:

OFFICE OF TECHNICAL SERVICES
U. S. DEPARTMENT OF COMMERCE
WASHINGTON 25, D. C.

U. S. JOINT PUBLICATIONS RESEARCH SERVICE
1636 CONNECTICUT AVE., N.W.
WASHINGTON 25, D. C.

F O R E W O R D

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JPRS: 4435

CSO: 1446-S

SELECTIONS FROM JEN-MIN JIH-PAO, PEIPING, ON GEOLOGY, EXPLORATION, WEATHER FORECASTING, AND CARTOGRAPHY

[The following are full translations of selected articles from Jen-min Jih-Pao, Peiping, 15, 18, and 19 December 1960.]

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PUT GREAT EFFORTS INTO THE DEVELOPMENT OF CHINA'S GEOLOGICAL SCIENCE

[Following is the translation of an article written by Hsiao Ying, Vice President of the Peiping College of Geological Sciences, in Jen-min Jih-pao, Peiping, 15 December 1960, page 7.]

The earth is a place where people live. Very early people began to attain a knowledge of the earth. But only after the rising of modern industrial production power did geology gradually develop into an independent science. Its history goes back about 200 years. Geology derives its origin from production practices. Accordingly, the speed of development of geology in any country reflects the height of production power of that country.

In digging mineral products and opening up rivers, China's laboring people utilized subterranean water, earthquakes, floods, and other natural disasters as objects of their struggle. From very early times they accumulated rich experiences. China was the earliest country to make use of coal. Before the Ch'in Dynasty, salt mines were dug in Szechwan Province. In ancient times China's laboring people had attained outstanding accomplishments in irrigation. During the period of the "Warring States," the creation of the Cheng-kuo Canal not only facilitated irrigation, but also successfully drained the subterranean waters and improved alkaline lands. The mines discovered by the people in the various ages were countless in number.

Because China's development was stopped in the feudalistic stage for a very long period of time, the development of her productive power was very slow and the talent of her laboring people was never given the proper attention. The system and contents of China's recent geology were principally imported from foreign countries. Before the Liberation, though there were a number of geologists who, perhaps, desired to develop China's natural resources or to summarize China's geological characteristics by creating and developing China's geological science, imperialism, feudalism, and bureaucracy jointly subdued this hope.

In more than 30 years' time, beginning from the establishment of geological enterprise in China in 1912, to 1949, the development of geological science in China was very slow. Of course, during this period, because of the great efforts rendered by certain geologists, China made definite contributions in the study of earth strata, ancient biology, dynamical-geology, ancient anthropology, and geo-structural studies. But, owing to the social conditions of those times, these geologists could not free

themselves from the influences of the capitalist world point of view, so their works were detached from practical production. A few of them were so deeply influenced by imperialism that they became imperialist mouthpieces and spread the erroneous notion that "China's mineral quality is very poor; China is broad in territory but not bountiful in resources."

For instance, there was an article published in the Pei-yang Science Quarterly, No. 3, Volume 1, 1933. It said, "In the recent 20 years, those who have discussed China's mineral resources are either Chinese or foreign geologists or engineers. That China has no great mineral deposits has become an evident fact. This statement is based on scientific and actual investigations. It is not a false statement." Here, "science" had become a tool by which the confidence of the Chinese people had been completely dissipated.

Now China has been completely liberated. Under the Party's able and correct guidance, the development of geological science has attained favorable conditions. During the 11 years since the establishment of the People's Republic, enormous accomplishments in geological activities have been attained, especially under the brilliance of the three red flags of the general line, the great leap forward, and the people's communes.

Since 1958 there has been an all-Party and all-people geological mass movement promoted throughout the country. The development of geological activities has attained a progress of ten-thousand li a day. More and more mineral deposits have been discovered. These new accomplishments have completely demolished the false propaganda scattered by the imperialists and their fellow-travellers stating that China's mineral deposits are very poor. On the other hand, under continuous development in production, geology has assumed new obligations, enabling the various phases of the geological science to attain unprecedented developments. For instance, there have been new discoveries and creations in the formation of laws pertaining to iron, copper, and lead deposits, and the theories and methods of the earth's structure affecting the formation of mineral products and the prospecting of mineral deposits. Many other departments of geological science have also been vigorously developed such as hydro-geology, geological engineering, geo-chemistry, prospecting engineering, geo-physical prospecting, etc.

Especially important is the fact that geological teams have been unprecedentedly enlarged. On the one hand, in the all-Party and all-people geological movement, the great mass of laboring people have begun to understand modern geology. On the other hand, the number of specialized geological workers has rapidly increased. Within the last several years, just the Peiping College of Geological Sciences alone has trained so many geological cadres that the total number is equivalent to more than 20 times that of geological workers trained by the old regime during the last several decades. Even this great number of geological cadres is insufficient to meet the needs of the great leap forward.

In order to realize the modernization of industry, agriculture, and scientific culture, the types of mineral products have become more numerous and the amount has become greater. The modern scientific and

technical developments, such as atomic energy, semi-conductors, rockets, radio electronics, etc., and the creation of highly fine and heavy machinery all need special raw materials which are principally taken from under the ground.

With the rapid developments in agriculture, an abundant supply of subterranean water and a great quantity of phosphorus, potassium, coal, clay and other fertilizer raw materials are urgently needed.

We must rapidly discover and prospect more mineral deposits. Owing to the gradual realization of many great plans for the improvement of natural resources, there arises a series of new problems confronting the geological scientist.

It is obvious that China's geological science is constantly marching forward in order to meet the rising needs of socialist construction. The prevailing circumstances urgently demand that this science develop into a new stage of the leap forward.

Judging from the development of geology itself, it must leap forward and it can leap forward. Geological science is the summarization of laws by which mankind has obtained practical materials from the surface and depths of the earth. Chairman Mao Tse-tung has said, "A Marxist believes that the productive activities in human society have developed from the low levels, step by step, toward the higher levels. So, man's understanding, either in the natural aspect or the social aspect, is also developing from the low levels, step by step, toward the higher levels." (Selected Writings of Mao Tse-tung, Volume 1, page 272).

Consequently, the development of each science must undergo a process of accumulating factual materials. Perhaps, owing to the enormous body of the earth and its complicated phenomena, from man's point of view in regard to time, many geological transformations are too slow and cannot be easily observed. During the 200 years dating from the establishment of geology to the present, the accumulation of materials has been the key point. Just as Engels said, "The first stage of a new natural science is the stage of holding fast to the prevailing materials. It has already attained great achievements in the fields of mathematics, dynamics, astronomy, statistics, etc. But geology and ancient biology were not in existence yet." (See Natural Dialectics, page 159.) In the scope of geology, there are more descriptions than theories and more suppositions than laws. According to an investigation covering the materials taught in nine principal geological courses, a greater part deals with the description of mineral products, mineral rocks, mineral beds, ancient biological fossils, and geological structural formations.

The accumulation of factual materials is extremely important, and from now on it must be continued. After the Liberation, because of the unprecedented development of specialized geological production, the material contributed to this field has been very rich. Prospecting is an important means of discovering what is hidden under the ground. The amount of work done in this respect reflects the degree of information we have obtained. In the ten years since the Liberation, the amount of work accomplished in this field is 150 times that done during the several

decades prior to the Liberation. In addition, we have obtained a great amount of geo-physical prospecting materials.

But, if we have only descriptive and reflective material, this is incomplete and does not reflect the nature of matter. In the new and great amount of actual facts and under the new situation, China's geological science must rapidly raise its theoretical level and improve its scientific appearance to more effectively promote practical production. We cannot say that in the past geology did not raise the factual material into theory, but we must admit that our understanding was inadequate. In general, our studies have been centered more on the external characteristics of matter. One of the reasons is that we have not made a full and timely utilization of the new scientific accomplishments in the fields of physics, chemistry, and dynamics, and we have not thoroughly investigated the form of the earth's motions.

At present, the development of the scientific technical level, on the one hand, has penetrated into the interior of an atom, and on the other hand, has directly gathered scientific materials from the stars. It is possible that these new developments will enable us to have a more thorough knowledge and a better understanding of the nature of the earth. Ideologically speaking, today, under the guidance of the Party and Chairman Mao Tse-tung, our geological workers have attained ideological reforms and have just aroused a high tide to learn from Chairman Mao Tse-tung's writings. This is a favorable condition that has a decisive meaning for the development of China's geological science.

Under these circumstances, in regard to how the present geological science may be developed, we have offered the following opinions for our comrades' reference.

Develop Comprehensive Study and Bordering Sciences

First, in the present geological science there is a very strong tendency toward the isolated study of external characteristics of matter. This study has often assumed these external characteristics to be universal laws. This does not agree with objective reality. For instance, in regard to the study of mineral beds, in the past, a greater part of the study was interested in the study of the mineral body but neglected the material relation between the mineral body and its surroundings. There was no attempt to organize the matter into a group or collective body as one total body for study. When the study was made over the laws of mineral formations, in many places no attempt was made to explain the nature of matter. This naturally did not agree with objective reality. The theories themselves often conflicted and did not deal with the principal contradictions in geological transformations. Cause and effect were improperly presented, and they arrived at conclusions that were not factual.

For instance, attention was given to one external cause, the temperature at which mineral products were formed, but the more basic problems were neglected. In regard to one mineral deposit where the mineral products were formed under different temperatures, a long debate was

often promoted.

Further, some zoologists, based on certain ancient animal fossils, pronounced that a certain stratum of earth belonged to a certain age, while some botanists, based on certain ancient plant fossils, claimed a different age for the same stratum. Therefore, in order to enable geological science to leap forward to a new level, there had to be a penetrating study of the nature of matter. "On the total body of the surrounding world, and in the internal relations between all the phases of the surrounding world, we must develop the surrounding world." (Mao Tse-tung's Selected Works, page 275.)

The application of this statement is the strong development of comprehensive study and of bordering sciences. At the same time, we must hold fast to the principal contradictions and penetrate into key-point problems. We must link all related sciences or all that are located in one locality or the different phases or an overall problem together into an entity for study, instead of rendering the related sciences into completely antagonistic and isolated subjects. In studying, we must not only use the existing geological methods but must also employ all the new achievements in the fields of physics, chemistry, electronics, and dynamics. We must not just study the "individual body" of the mineral deposit, the mineral product, and the elements that formed the mineral stratum, but we must also study their "collective body." In such a way, we will arrive at conclusions that will be more closely related to the objective laws.

In order to strengthen comprehensive study, we must at the same time strengthen our penetrating understanding of individual matter. In order to make a penetrating investigation of geological laws, we must apply modern scientific technical results. This leads to the coordination of geology with physics, chemistry, dynamics, and biology. Physics and chemistry are two sciences that study the laws concerning the movement of matter. But to view the surface of the earth as an entire entity will show a very great characteristic. Generally, the physical and chemical laws very often cannot fully explain the laws of transformation in the development of the earth's surface; therefore, it is extremely necessary that the bordering sciences of geo-physics and geo-chemistry be developed. Following a penetrating understanding, there must be an all-out comprehensive study. For example, when there is a new crack or bend occurring in the earth's surface, it appears to be the physical phenomenon of a mechanical transformation. But in its process of development, there must be, at the same time, some complicated chemical transformations. This requires that various related sciences study the earth from a unified point of view.

Though the bordering sciences, in recent years, have attained some developments within the field of geology, their proportion is not very great. We must, under the guidance of Mao Tse-tung's ideology, knowingly encourage the coordination between these sciences. This is a very important phase in the development of geology.

Coordinate the Study of China's Special Laws and the World's General Laws

Secondly, if we want to develop the geological science, we must study its general laws and also study its characteristics. The earth is not a uniform material body. It is very clear that the different areas possess their own characteristics. China especially has a vast territorial surface with many mountains, and there have been frequent transformations in the history of geology. These are special characteristics. For example, the structural movement that is extremely important in affecting the surface of the earth has shown special activities, directly affecting the laws of the formation of China's mineral products. But, in the past, many people utilized foreign theories to generalize China's geological phenomena. The factual materials of these foreign theories were derived from Western Europe and North America and they were not general laws. When they were applied to China, there were inevitable erroneous conclusions.

Many erroneous notions saying that China's mineral deposits were very poor were caused by these foreign theories, or at least a part of these notions were. Land sediment accumulation in the foreign countries is very rare and they seldom see any formation of petroleum and sylvite in land sediment accumulation, so they naturally draw negative conclusions. Some people blindly follow suit, but in reality they have not studied enough of China's geological characteristics. In the past, there were very few geological theories that were based on China's characteristics. Therefore, strengthening the study of the father land's characteristics in geological laws is not only an important phase in raising the scientific level of China's geology, but is also a great contribution to the world's sciences. This is the promotion of the entire geological science.

It is important to study China's geological characteristics. But, in order to bring our understanding closer to the truth, it is also important to study the nature of the entire earth. Only through such a method can we attain a more correct understanding of China's geological laws. At present, there is not enough study done in this aspect; from now on we must develop it.

Develop Practical Geology

Thirdly, practice is extremely important to the development of science. But this has been a weak link in geology. For many years the method of geological study has consisted principally of observation, induction, and conclusion, while practice has been place in an unimportant position. It is due to that fact that many geological transformations have occurred under super-high temperatures, super-high compression, and complicated natural phenomena and have developed through very long periods of time. But frequently, it has been stressed that certain facts cannot be tested, so many theories in geology have not been proved, and we have knowingly not put any great effort into this aspect. Now, owing to the rising of the technical level in super-high temperature and super-high compression, it is possible to conduct a number of geological tests with

molds. From now on, activities in this field must be further strengthened, otherwise many geological theories will not be able to be established on the laboratory basis, and they will not attain further development.

The development of practical geology not only imitates natural phenomena but also helps people to understand nature, and even enables us to make effective improvements in nature. Let us suppose that we could understand more about the laws pertaining to the scattering and concentration of elements on the surface of the earth, we could learn the laws concerning the formation of mineral products. Then, we could utilize nature's own transformations so that they would develop in a direction which would be advantageous to us. For instance, if we concentrated certain useful elements on the surface of the earth, we could realize the artificial formation of mineral products.

If we could profoundly understand the laws concerning volcanic and earthquake movements, we not only could prevent destruction, but also control and utilize their enormous energy.

It is possible for these ideas to be realized. The establishment and development of practical geology is a very important key in the leap forward development of geological sciences.

Strengthen the Study of Mining Prospecting Theories and Methods

Fourthly, the leaping developments of production create favorable conditions for the development of geology. The various goals of geological study are the more, faster, better, and cheaper ways for the discovery of mineral deposits and for the improvement of nature. They will promote the rapid development of geological activities. Accordingly, in addition to the search for basic geological theories, there should be a study for the mining prospecting theories and methods.

Under the guidance of the Party's policy of socialist construction and of "walking on two legs," China's mining prospecting activities are just creating new and rapid experiences and summarizing these theories for a greater promotion of the development of geological activities.

For a long time the instruments used in geological activities have been very backward in many respects, for example, using the naked eye to scrutinize mineral products. In the field of geological prospecting, technical reform and technical revolution have been raised to an important position. This year's technical reform and technical revolution movement has already attained great achievements.

The rapid development of production and the improvement of tools are the bases for scientific development. Today geology is facing such a favorable situation. Only through close coordination between geology, existing production, and the prevailing technical reform and technical revolution movement can there be a continuous leap forward.

In the development of geological enterprises, our institutions of higher learning are one important front, carrying an important task. Judging from the conditions in the Peiping College of Geological Sciences, scientific study can be entirely coordinated with teaching and production.

Through scientific study, the task in teaching can be fulfilled and the difficulties in production solved. In the practice of scientific study, the above direction can be reached and the scientific level and teaching level will be raised. As in the drawing of "the map for China's earth structure and mineral prospecting," the instructors and students utilized the comprehensive study method and contributed some creative opinions, pointing out the direction for production. At the same time, they completed the course, "The Study of Area Geology and Earth Structure."

Now, we are coordinating the teaching of the course on "Mining Prospecting" with the rapid promotion of prospecting study. Only if we implement the Party's educational policy, raise high the red flag of Mao Tse-tung's ideology, constantly promote the ideological revolution, insist on the Party's guidance, make scientific study follow the mass line, and arouse a mass movement, will we be able to raise China's geological science to climb up rapidly to the world's highest peaks.

A TRIP INTO THE TAKLA MAKAN DESERT

[Following is a translation of an article written by Sung Cheng-hou in Jen-min Jih-pao, Peiping, 18 December 1960, page 4.]

Recently this writer joined the Desert Comprehensive Observation Team of the China Academy of Sciences and made a trip to the world-famous Takla Makan Desert. We started from the old city of Yu-tien and walked toward the interior of the desert. The trip took 20 days and covered 300 kilometers round trip. In this mystic land, for the first time, we saw the boundless stretches of desert and the ruins of ancient villages and cities. We also saw how the people of the Uigur Tribe have conquered the desert.

The Prosperous New Village in the Desert

"Takla Makan," in the Uigur language, means "once you go into it, you cannot come out." The people of the old city of Yu-tien, on hearing that we were to journey into the desert, were surprised. Many old folks of the Uigur tribe told us strange stories about this mystic land.

On a clear morning, we left the old city of Yu-tien and travelled northward along the Keria River. After four days we reached the Yeh-lieh region. Here the Keria River is like a winding silver ribbon, flowing along far into the north. On the east bank of the river there is a series of sand dunes, 70-80 meters high, like a natural shield, erected along the river to protect it against the northeast wind. In the valley there are reeds, liquorice roots, wild flax, red willows and poplars. On the west bank of the river there is an enormous new dike and a vast network of irrigation ditches crisscrossing the land. In the area where the ditches are, there is a boundless stretch of newly-opened fields. In some of these fields we saw wheat sprouting, while others are just being deeply cultivated. Along the bank of the river there are rows of new houses built of reeds. This is the encampment of the army of reclaiming workers. This is the new village in the desert, showing an atmosphere of prosperity.

After one day of observation we met Comrade Ts'uan Hsiao-hua, Secretary of the Party Committee of the Yu-tien Vanguard People's Commune, who is leading the reclamation movement in this region. He told us, "In February of this year, Wu Chi-min, the first secretary of Yu-tien Hsien,

led a dozen or so cadres from the people's commune, riding donkeys, carrying water and rations, and prospecting along the Keria River for waste lands. Each day they slept on the sand dunes or on the grasses. They drank water and ate rations. In the journey of several hundred li, they discovered many places with surface water, reeds, and swamps, so they confidently said, 'Where there is water and land, we can grow crops.'

"So, more than a thousand men and women from the Vanguard People's Commune took along native hoes and blankets and went to this area, seldom visited by man, to begin their conquest of nature.

"In transforming a desert into farm land, the first problem is water. But if the river bed is too low, how can water be drained up to a high land? They built several dikes across the river to raise the elevation of the water. Everyone from the Party secretary to the team leaders joined in cutting grasses and digging ground. They worked for a while, then climbed up on the hot sand and rested for a while, and again jumped back to work. After a few days each cadre was scorched by the sun.

"After the completion of the dikes other problems arose. Merely relying on native hoes, they were supposed to dig ditches in the flowing sand. While they were digging the wind was blowing. As soon as they dug a ditch, the sand fell back and filled it up. The wind blew so hard that they could not even open their eyes. The secretary of the Party Branch and the people together created the "stair-type of passing the earth" by digging a section of ditch and holding the two banks up with reeds. This method prevented the blowing of wind.

"The difficulties were solved one by one. The morale of the masses and the cadres became higher. After several months' struggle, they built three cross-river dikes and a large 30-li long ditch. They reclaimed 20,000 mou of waste land. In some of the land crops were planted. After the communalization, the commune members constructed new plants for the iron industry, bricks and tiles, hunting, liquorice roots, wild flax, and poplar ash processing. The desert has now become a new village under socialism. At present, they are planting a sand prevention forest and promoting the forestry and animal husbandry enterprises. For the residents there are dormitories, schools, infant centers, a children's home, which are all being well planned. Construction of some of them has already begun."

The Past and Present of T'ung-ku-pa-ssu-t'ai

After eight days of marching, we reached the delta area of the Keria River. There was no water. Before our eyes stretched the bone-dry river bed, nearly one thousand meters wide. In the evening we saw before us a vast stretch of greenish and black hills. We ran toward them but the hills disappeared; instead we found an enormous forestation. In the depth of the forest, we found a small village with a dozen or so families. An old man of the Uigur tribe welcomed us. It was then we found out that we had already arrived at the heart of this great desert, the T'ung-ku-pa-ssu-t'ai [sic].

In the moonlit night we set up the radio and were preparing to

listen to broadcasts from the capital. By this time the old folks all came around. They began to surround us. On the one hand, they were filled with wonder at this new object, the radio, while on the other hand, they told us a story that had happened here. An A-man-erh /sic/ old man said that one day in 1953, two strangers in uniform arrived at this village on donkeys. Just as they entered the village all the people in the village, young and old, as in the days of the Nationalist regime when they would flee at the sight of an official or a ranch owner, so they all disappeared into the forest. They watched every move made by these two strangers. But very strange to say, these men did not enter their houses nor did they take away their sheep; instead they cleaned their animal quarters, and adjusted their feed. During the day they drank from their well and in the night they slept in the open. By this time, the old folks were moved, yet they still had some doubts. However, they came out from the forest and talked to the strangers. The first thing the strangers told them was that there were no more corrupt officials and cunning merchants in Yu-tien Hsien. Instead, there were Communist Party members and the Liberation Army. The strangers were their cadres and they were obliged to serve the people. From then on these people knew the world had changed.

It was under the guidance of these two government cadres that T'ung-ku-pa-ssu-t'ai became a cooperative. Afterwards, the People's Government sent a commerce team and veterinarians there, and gave them fabrics, flour, vegetables, and fruits, etc. Their living standards improved greatly.

Last year, the Hsin-sheng People's Commune was established in Yu-tien Hsien. It was once an animal husbandry production team. With the aid of the commune they built new houses and established a sewing store and a blacksmith shop. After the communalization, their positive labor factors rose high. They dug wells, built dikes, prevented floods, drew water from wells, planted young forests, and built up ranches. The number of animals was increased by 6,000. Victory encouraged these people. By the beginning of this year they had reclaimed more than 100 mou of waste land, planted crops, and attained results. When the crop ripened, the A-man-erh old people held up the grain in their hands and said in tears, "During the last several years, though we have already eaten while flour, now is the first time we have seen grain."

The Old City of Ch'ia-la-tang-k'o

We marched another day and reached the old city of Ch'ia-la-tang-k'o. /sic/. We all wandered around the place. Some were looking for old ruins, some were seeking old coins and broken utensils, some were busy taking pictures and drawing sketches, and some were taking samples of sand.

This old city was of a ring shape, several hundred meters in perimeter. Outside the city was level upon level of sand. These were crescent-shaped sand dunes, some were like pyramids and some were rectangular. Amidst these sand dunes there were red willows and dried poplars. Our guide told us in a humorous manner that these dunes appeared to be full of awe, but

when a windstorm arrived, they became as tame as lambs being led from place to place. Therefore, no one knew how many ancient cities were buried by them. Ch'ia-la-tang-k'o was an old city that was buried under the sand.

At the center of the city where it was relatively low, we discovered a long beam more than ten feet in length. Judging from this, people believed that this was the court house of the old city. It was said that this city was surrounded by oases 300 years ago. According to present-day investigations this was the city located on the bank of an ancient river. Outside the city, there were many decayed poplars, red willows, reeds and grasses. In the past, people relied on the green vegetation for a herding life, but several centuries ago the river changed its course. The grasses and plants died off first, then the poplars and red willows lost their adaptability. Sand and wind invaded the region, so its inhabitants had to move away. The ruins of this old city were thus left until today.

We continued to march on toward the southeast. In the late afternoon we crossed a sand mountain and a sheet of light reflected from a body of water struck our eyes. When we could see water in the depth of a desert, naturally we were very happy. In the midst of sand hills there was this round lake, covering an area of several square kilometers, surrounded by trees and grass. In the center of the lake there were small islands. The water of the lake was deep blue and rippling with waves. This nameless "heavenly pool" will give boundless strength and courage to those who will come to conquer the desert.

After we had travelled for more than ten days, we knew that the lower stream of the Keria River had no surface water resources, but that the melted snow from the Koulkun Mountains, after running a long distance underground, becomes collected under the depth of the desert. This is a very valuable resource.

WEATHER SENTINEL

/ Following is a translation of a news report in Jen-min Jih-pao, Peiping, 18 December 1960, page 7./

Kansu Province has established more than 1,000 weather stations (units, outposts) and has about 20,000 weather sentinels fulfilling this glorious task. They know a great amount of weather slang and possess many weather forecasting experiences. They have also organized a supplementary forecasting network in the various areas. They have modern weather science and at the same time have mass experiences. Thus, weather forecasting has become a better service to agricultural production and has greatly reduced the damage done to the crops by frost, windstorms, cold currents, hail, and snowstorms. In this respect several stories have been told.

Safe and Sound

In the late afternoon the wind rose suddenly, dust blew all over, and one could not see the face of an approaching person. But the hay stacks of the Ta-chia-liang Production Brigade in the Chin-chuan People's Commune in Lanchow were solidly piled up and flocks of sheep had been driven back into their folds. Everything was safe and sound. The commune members smiled with satisfaction.

In the afternoon of the day when the windstorm occurred Yang Ching-ying, the leader of the Mu Kuei-ying Weather Unit of the Ta-chia-liang Production Brigade, learned from a radio broadcast that a windstorm was approaching. In order to make the forecast accurately, she checked her own laboratory, looked over all related weather sayings, carefully observed the changes occurring in the sky, and consulted some old peasants who were accustomed to "looking at the heavens." According to the conditions known to her, she began to analyze and study, and finally concluded that a great windstorm was coming. She reported this to the Party Branch of the Production Brigade.

The Party Branch immediately organized two armies. One rode on bicycles to inform all those who had led out their flocks of sheep, and the other went to investigate all the houses and animal quarters. Those that needed strengthening were strengthened immediately. The haystacks were pressed solidly together by stones, doors, and mud to prevent the straw from being blown away.

A Clear Sky for the Rushing of the Harvest

The grassy plain in the southern part of Kansu Province is well known for its unpredictable changes in weather. During the autumn harvest this year, cloudy and rainy weather continued without end. Watching the crops ripening day after day, the people became seriously anxious.

In Lin-t'an Hsien the workers at the weather station and the members of the Tao-yin People's Commune were anxiously hoping for the coming of a clear day. In order not to let any clear day slip by, they constantly kept a close watch over the changes in the sky, carefully observed the various facts concerning weather, and made a close study of all the material they had gathered. As soon as they arrived at any conclusions they would, in spite of the rain, go from house to house to consult the old peasants. Owing to their great efforts, they finally came to a prediction that two days, the 25th and 26th of the month, would be clear. With great delight they issued the forecast.

The Party Committee of the Tao-yin People's Commune, on the basis of the forecast, immediately mobilized all labor power and made all preparations. When the predicted day arrived it was really a very clear day. All commune members joyously joined in the rush to harvest the crop. Because of the preparations, for two hard-working days the entire ripened crop was completely harvested and all losses were avoided.

Agricultural Weather Changed

In Tung-chih-yuan, which has always been known as the grain warehouse of Shensi Province, every year after the winter ends and the wheat begins to grow, there has appeared in every field patch wheat seedlings which are being frozen to death. And during the summer rain and wind the crop has frequently been blown over. Consequently, it has been one of the important problems for every weather forecast worker to worry about searching for an effective way to guarantee that the wheat seedlings will safely pass the winter and be able to stand the summer rain and wind without being blown over.

Wu Hsiu-chen, a young girl weather forecasting worker in the Hsi-feng People's Commune of the Ching-yang Hsien, through study of the weather materials in the weather station, has found out that on the Tung-chih-yuan plains there have always been winds blowing to the north and northwest during the winter and spring, and to the southeast during the summer and autumn. Based on these characteristics, she believed that a good crop needs plenty of sunshine and a proper air ventilation. With this assumption she contributed a bold and new suggestion, and said that it was an advantageous factor to change the original way of arranging wheat rows from the east-west direction to the north-south direction.

The Party Committee studied Wu Hsiu-chen's suggestion and believed that she had many good points. For instance, in arranging the wheat rows parallel with the direction in which the wind blew, there is a better air circulation and the wheat stalks will not be blown over as readily. At

the same time, the crop had more sunshine and the wheat stalks were in the sunshine for a longer duration. Since the wheat stalks received a more even sunshine, the effect of sun on the growth of the crop was strengthened. The crop not only ripened more evenly, but seedling death during the winter has been greatly reduced.

In the winter last year the Hsi-feng People's Commune changed the direction of its wheat rows in a portion of its wheat fields. The result of this experiment was very satisfactory. The rate of seedling death was effectively reduced. In this year's winter sowing more production teams will expand this advanced measure.

WHAT CAN CARTOGRAPHIC WORKERS DO FOR AGRICULTURAL PRODUCTION?

/Following is the translation of an article written by the Cartographic Studies Section, Geographic Studies Laboratory, China's Academy of Sciences, in Jen-min Jih-pao, Peiping, 19 December 1960, page 7./

In agricultural production many links make use of maps. Almost every item of activity in the "eight-word charter" in agriculture has some connection with maps. Following the promotion of irrigation, agricultural reclamation, and forest investigation activities, cartographic workers made many topographic maps and investigated many specialized maps. Especially after the establishment of the people's communes, a series of tasks was assigned to cartography.

During the last years, under the Party's guidance, all the cartographic, geographic, and construction engineering workers throughout the country, together with the peasants and masses, coordinated and planned their tasks and promoted about 100 map-making tests in the various people's communes and attained numerous experiences and achievements. However, present cartographic works are far behind agricultural needs. This situation is principally shown in that the types and contents of maps are too simple, the map scales are too small, the maps do not coordinate with agricultural production very closely, and the maps have not helped in providing an overall solution to production problems, etc. In order to implement the outline for national agricultural development and to respond to the appeal for the all-Party and all-people promotion of agriculture and grain production, the cartographic workers must exert greater efforts in their work.

What is the most urgent task that the cartographic workers can do for agriculture? First, their service must help to expand the cultivation area and to prevent natural disasters. Then, their services will be gradually applied to farm production and landscape planning and for the realization of the four-mechanization movement in agriculture. Tentatively speaking, the following several activities will coordinate with agricultural production.

1. Thorough investigation of land resources. No matter whether to raise the per-unit production output or to expand the cultivation area, the primary need is to make a thorough investigation of all land resources. A detailed investigation must be made on the conditions of present cultivation in each piece of land. Based on the difference in soil and fertilization, land must be classified into various types and classes and their

areas must be calculated.

These are the urgent problems that are confronting the people's communes and the production teams now. As such, we must first have in our possession reliable figures concerning the distribution and area of cultivation land. Otherwise, we cannot keep an accurate account of land and water, and in the straight-line planning there will be many difficulties in production output estimates, production arrangement, and control. In the thorough investigation of land resources, if we have only statistical figures and no maps, the material is not complete. For instance, if we were to select a certain piece of land for the people's commune for the cultivation of an economic crop, we must not only have figures concerning the cultivation area and weather records, but also a map showing the difference of soil, weather characteristics, and topographic features. In this way we will discard those fields which are not suitable for such an economic crop and those fields suitable for the high production of other crops. Then, finally we will follow the indications on the map and use only those fields which meet the needs of such an economic crop and those that meet some of the needs. Such a method of map-making was applied in the planning of water preservation and in the selection of lands for the growing of oranges. It proved to be a successful method.

Based on local technical conditions and with the more, faster, better, and cheaper methods, the cartographic workers must make a large-scale map for the people's commune, showing in detail the boundaries of the various production teams, the border land and farm edges, irrigation ditches, the network of roads and all the other facts related to agricultural production. Such an activity is very important.

2. Analyze natural factors. Only through the overcoming of natural disasters can we attain a rich agricultural harvest. In the national agricultural development outline, it has accurately been pointed out that agriculture must be based on local conditions and carried out on time. Consequently, in any people's commune or production team, it is necessary to make a map containing detailed natural factors, so that improvements, planting, and fertilization can be made in accordance with the special features of each piece of land.

For instance, if we want to solve the flood water drainage problem of a certain farm (or crop-growing area), we must have a flood drainage map. On such a map we must not merely draw the hydrological features of the rivers, storm probabilities, the elevation of the land, the soil's ability to absorb water, and the other causes for floods, nor should we just mention the historical facts concerning flood and the measures applied at the present (these merely are phenomena and understandings concerning natural laws and the contents and working process). But, we must make an account of water and contribute measures for the prevention of floods. On the map the proportion of the causes of floods and the various differences of the fields must be listed, pointing out the amount of rainfall, the rise of water level, and the possible scope of disaster (the relation of the accurate amount and the area of distribution). We

should suggest various measures of blocking the flow of water, the dispersion of flood water, the digging of ponds, and the arranging of control areas (these are the basic problems and the answers to the needs of production practices). In making a map with the estimates for mechanical cultivation, soil improvement, and natural conditions for drought resistance, we must insist on the application of these viewpoints of close service to agricultural production.

3. Directing farm production. The improvement of cultivation methods, reasonable fertilization, reasonable irrigation, reasonable crop rotation (the change of crop every year), alternate cultivation, complete cultivation and close planting, timely sowing, weeding among the seedlings, and harvesting, are detailed and complicated activities. Through the form of map-making, the strengthening of farm control is relatively a scientific working method.

For instance, in drawing the edges of the farms and the boundaries on the map, based on each field or crop area, indicate the various cultivation norms, quantities and progress on the map. These measures will facilitate the direction of production. If we let the masses possess a production direction map and the straight-line planning method, and at the same time formulate them into a streamline as a means of adjusting labor power, selecting a farm land, arranging crops, constructing roads, and making production estimates, the direction of production will be more effective. If we can indicate on the map the class of land, the distance of transportation, the amount of supplies needed, we not only can use these as the basis for straight-line planning, but we also can list the results attained by straight-line planning into the new map. This is a promising working method to improve labor control and to raise production efficiency. In addition, if we accumulate these maps from year to year, they will become a good file of land materials. To use maps as a means of carrying out land control is a new technique of control and it has great political value. Uniting production goals and fields together, plainly shown on the surface of a map so that the masses can see them, can further promote socialist labor competition and encourage the masses' productive morale.

4. The realization of garden farming. Garden farming is the concentrated manifestation of the "eight-word charter" in agriculture. In order to realize garden farming, we must make more detailed considerations for the capital construction in agriculture.

For instance, a rich crop and a seedling basis request that "the irrigation ditches must be straight as a line, the land must be level as a mirror, deep cultivation and close planting, fine cultivation and careful working." These require the investigation and study of the nature of the soil, the irrigation conditions, and the production level of suitable crops. On the original basis, we can make new arrangement for irrigation and roads, establish green belts and fertilizer accumulation points, contribute various farming measures to level the lands, improve the soil for mechanical and high production, and make maps for agricultural engineering.

In addition, the construction of small irrigation engineering, the prevention of floods, water drainage, the improvement of lowlands, the adjustment of terraced fields, the preservation of moisture, the creation of green forests and the other farming engineering projects must all be carried out in a planned manner. These all require agricultural planning maps. These agricultural planning maps do not necessarily follow the "form" of engineering blueprints, but they must be simple and convenient, showing the shapes clearly so that they will meet the needs of publicity and education. Among these, solid map molds constitute a good form.

Cartographic knowledge is derived from agriculture. In ancient times, the land survey of flooded plains in the East was the earliest beginning of cartography. The so-called fish-scale map records preserved from the Ming Dynasty showed a detailed description of the field boundaries, land pieces, and soil grades at the same time. In the recent dynasties another collection of maps has been published based on agricultural statistics.

But these agricultural maps and those that are needed directly for the service in the first line of agriculture are different in goals and contents. Furthermore, the old-fashioned notions contained in these "agricultural maps" seriously affect the thinking of these cartographic workers. For instance, at present, on an ordinary map, there is not enough information and examples pertaining to agriculture. Deserts and swamps are classified in five or six types on a map, but cultivation lands are merely divided into paddy and dry fields. Even on a map with a 1/thousandth scale, we cannot find the boundaries for people's communes, administrative districts, and production teams, let alone the indications of irrigation ditches, farms, crops, and soil qualities. Generally speaking, these maps have a relatively high degree of accuracy, but when they are used to solve problems in the planning and control of farm lands they are far from adequate. Therefore, the cartographic workers must overcome their capitalist viewpoints and clearly use agriculture as the basis for ideological instructions. We must make profound analysis and study of China's geographical and agricultural characteristics, expressing an independent spirit, improving and enriching the contents of maps to meet the needs of agricultural production.

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